

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in this Application:

Listing of Claims:

1. (Cancelled)
2. (Cancelled)
3. (Cancelled)
4. (Cancelled)
5. (Cancelled)
6. (Cancelled)
7. (Cancelled)
8. (Cancelled)
9. (Cancelled)
10. (Cancelled)
11. (Cancelled).
12. (Cancelled)
13. (Cancelled)
14. (Cancelled)
15. (Cancelled)
16. (Cancelled)
17. (Cancelled)
18. (Cancelled)
19. (Cancelled)
20. (Cancelled)
21. (Cancelled)
22. (Cancelled)
23. (Cancelled)
24. (Currently amended) The An artifact, of claim 17, at least one part of which is formed from a feed stock composition comprising a polyethylene irradiated by a method comprising the following steps:

(i) selecting a polyethylene having a crystalline phase and an amorphous phase;

(ii) imparting partial crosslinking, long chain branching and/or oxidation to the polyethylene by subjecting the polyethylene to a dose of ionizing radiation, where said dose is applied (a) when the polyethylene is at a temperature where both the crystalline and amorphous phases are present and (b) while the polyethylene is in an oxygen-containing atmosphere, and where the gel fraction of the polyethylene, after irradiation, ranges from 0.01 to 8%, by weight; and

iii) optionally adding additives to the polyethylene after irradiation; where said artifact is a coated polar substrate and where said coating comprises an irradiated blend of linear low density polyethylene and high density polyethylene.

25. (Currently amended) The artifact of claim ~~18~~24, where said polar substrate is a metal substrate.

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (Cancelled)

32. (Cancelled)

33. (Currently amended) ~~The method of claim 26~~ A method of producing a feed stock comprising a modified polyethylene for use in a process for forming an artifact, film or coating comprising the following steps:

(i) selecting a polyethylene having a crystalline phase and an amorphous phase, and where said polyethylene is a high-density polyethylene with a density ranging from 0.945 to 0.970 g/cm³;

(ii) imparting partial crosslinking, long chain branching and/or oxidation to the polyethylene by subjecting the polyethylene to a dose of ionizing radiation, where said dose is applied (a) when the polyethylene is at a temperature where both the crystalline and amorphous phases are present and (b) while the polyethylene is in an oxygen-containing atmosphere; and

iii) adding where one or more additives are added to the polyethylene after irradiation through a masterbatch.

34. (Previously presented) The method of claim 33 where the total concentration of additives in the composition after irradiation ranges from 0.01 to 0.4 weight percent.

35. (Previously presented) The method of claim 33 where the only additives added to the polyethylene after irradiation are antioxidants.

36. (Cancelled)

37. (Cancelled)

38. (Cancelled)

39. (Cancelled)

40. (Cancelled)

41. (Currently amended) ~~The~~An artifact, at least one part of which is formed from a feed stock composition comprising a polyethylene irradiated by the method of claim 37, comprising the following steps:

(i) selecting a polyethylene having a crystalline phase and an amorphous phase, and where said polyethylene is a high-density polyethylene with a density ranging from 0.945 to 0.970 g/cm³;

(ii) imparting partial crosslinking, long chain branching and/or oxidation to the polyethylene by subjecting the polyethylene to a dose of ionizing radiation, where said dose is applied (a) when the polyethylene is at a temperature where both the crystalline and amorphous phases are present and (b) while the polyethylene is in an oxygen-containing atmosphere; and

iii) optionally adding additives to the polyethylene after irradiation;

where said artifact is a molded artifact made by injection molding, blow molding, rotational molding or other molding methods ~~and where said feed stock comprises an irradiated high density polyethylene.~~

42. (Cancelled)

43. (Cancelled)

44. (Currently amended) ~~The~~An artifact, at least one part of which is formed from a feed stock composition comprising a polyethylene irradiated by the method comprising the following steps:

(i) selecting a polyethylene having a crystalline phase and an amorphous phase, and where said polyethylene is a blend of high-density polyethylene with a density ranging from 0.945 to 0.970 g/cm³ and linear low density polyethylene

(ii) imparting partial crosslinking, long chain branching and/or oxidation to the polyethylene by subjecting the polyethylene to a dose of ionizing radiation, where said dose is applied (a) when the polyethylene is at a temperature where both the crystalline and amorphous phases are present and (b) while the polyethylene is in an oxygen-containing atmosphere; and

iii) optionally adding additives to the polyethylene after irradiation; of claim 37, where said artifact is a coated polar substrate and where said coating comprises an irradiated blend of linear low density polyethylene and high density polyethylene.

45. (Currently amended) The artifact of claim ~~38~~44, where said polar substrate is a metal substrate.